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ABSTRACT

This examination of the educational and economic advantages of using videocassettes instead of broadcast television for Open University distance education begins by noting that, while the potential importance of television in distance education is widely recognized by educators, students appear to be less appreciative. The Video Cassettes Loan Service of the Open University is then described, and the cost savings of the videocassette program over use of broadcast television are detailed. The advantages and disadvantages of abolishing the broadcast television component of the Open University's distance education program are considered, but it is concluded that broadcast television will remain a part of the program. Future options for television as part of the distance education program are discussed, and ways of increasing cost effective use of this medium are proposed. (13 notes/references) (EW)

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Videocassettes versus broadcasts

Revised paper for Teaching at a Distance No.25

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Abstract

Television is an expensive learning resource and it is becoming a scarce commodity in the Open University as more courses compete for a finite amount of transmission time. While the potential importance of television in a distance teaching context is widely recognised among educators, Open University students appear to be less appreciative. At a time when the University is faced with significant cut-backs in expenditure, television needs to be made a more cost-effective course component. This paper examines the educational and economic advantages of videocassettes compared with broadcast television and puts forward proposals for the format and distribution of television in Open University courses in the future.

Television in the Open University

In 1983 the Open University is spending £8. 99 million on producing and presenting television programmes. That is over 13 per cent of the Univeristy's total annual budget. On the other hand, given an average of 8.6 hours of television material per full credit equivalent [1], television amounts to less than two per cent of undergraduate course materials on average, excluding any notes or exercises. It is therefore an expensive resource. Secondly, broadcast slots are becoming anincreasinglyscarce resource in the University. In 1974 all courses had repeat broadcasts whereas in 1982 thirty two courses had single transmissions only as a result of the increasing number of courses competing for broadcast time. The cost and relative scarcity of broadcast television both suggest that it is a resource which should be used as efficiently as possible if it is to be used at all.

Few teachers would argue with the potential importance of television in a distance teaching context. There is an obvious need for a medium which can give home-based students vicarious experience of geological or industrial field trips, dramatic performances, laboratory demonstrations, social conflict or whatever. In fact, 23 different educational functions have been identified in successful bids for television broadcast resources by O.U. course teams.[2]

However, students seem to regard television differently. Although there have always been exceptions, annual broadcast survey figures have consistently revealed an equivocal student response to Open University broadcasts. Although by 1983 almost all O.U. students (98.5%) had access to a television set, the average viewing rate for O.U. broadcasts declined from 65% in 1974 to 53% in 1982 and at post foundation level

the average broadcast viewing rate in 1982 was 51%. That is, on average each student saw only half the programmes on his or her course.[3] Since television amounts to less than two per cent of undergraduate course materials on average, effectively roughly 13 percent of the annual budget is used to actually deliver less than one per cent of teaching material.

It is obviously a mistake to try to equate quantity with the quality of the contribution made by television to O.U. courses. However, not only are broadcast programmes being viewed less, they also appear to be appreciated less by students. Between 1979 and 1982 the average appreciation of television programmes on post-foundation courses, as measured by helpfulness ratings, declined from 3.53 to 3.33. Over the same period the proportion of students who thought their course programmes were not relevant enough to the course increased from 13 per cent to 16 per cent.[1] Although these ratings indicate that overall students who watch find their course programmes helpful, they nevertheless represent a significant deterioration.

In any discussion of the effectiveness of broadcasts it should be remembered that Open University television broadcasts perform a variety of roles in addition to their primary teaching function within courses. They are watched by a much wider audience including schools, colleges and the general public and the University undoubtedly benefits from this wider exposure. On the other hand the main purpose of course programmes must be to serve as course components and it is clear that their effectiveness in this respect is becoming increasingly limited.

Research carried out by the Institute of Educational Technology has shown for several years that there are three important factors which influence students use of and responses to O.U. television programmes: access, control and integration.[4]

Access to broadcasts is limited by the availability of transmission slots. There are two discernible trends in the availability of transmission times for Open University television programmes. Firstly, there has been the gradual reduction in the availability of repeat transmission slots. Secondly there has been a deterioration in the quality of the transmission slots available from the BBC. In 1974 over half the available transmission slots were regarded as convenient by 60 per cent or more of students. By 1979 only 35 per cent of the available slots were regarded as being this convenient by the same proportion of students.[5].

The control characterisitics of broadcast television have been discussed in detail by Bates.[4] To summarise, broadcast television is a difficult medium from which to learn because it is transient, proceeds at its own pace, is very often rich in content which can be interpreted in different ways, and at the Open University is frequently used in ways which require students to respond to it using analytical skills which many do not possess. Significantly, the University's own 'Learning from Television' package is designed as an integrated interactive videocassette/text package.

The twin problems of access and control have frequently led course teams to adopt policies of low integration between course texts and television programmes. That is, minimal references to programmes in course units and assessment items in favour of free standing programmes with supplementary notes. Although these policies were

intended to help students to use their course programmes more flexibly, they appear to have contributed to the general impression given that television is "the icing on the cake", an optional extra in many courses.

The Video Cassette Loan Service

By early 1981 it became apparent that in 1982 most of the weekday early evening transmission slots would be lost. Faced therefore with the prospect of a sudden and dramatic decline in programme viewing rates as a result of the loss of this comparatively good broadcast time, the University established an experimental Video Cassette Loan Service. The Service was designed to improve student access to programmes in two ways. Firstly it was intended to act as a substitute for repeat broadcasts on 37 selected courses. Students on these courses could each borrow up to two programmes per course at a time and keep them for up to four weeks. Cassettes were borrowed by mailing a request card to the Audio Visual Department at Walton Hall. Secondly it was intended to supplement the poor transmission times left for foundation courses as a result of the loss of weekday early evening transmission slots. All Regional Offices were issued with two copies of each of the foundation course programmes for use as a regionally based cassette library.

In addition the University hired 243 video cassette players and made these available throughout the Regions to supplement the availability of suitable replay equipment.

During the experimental period, 16,000 cassettes were requested, showing that there is a considerable demand for a cassette copying service. Just

over a third of requests (37%) were from students. The number of students who used the Service was 1375 or 12% of the total eligible population of 11,135 and on average they borrowed three cassettes each. Forty two per cent of requests were from Regional Offices and the remainder (21%) were from other users such as the faculties. Although some of these requests would have been made on behalf of students nevertheless demand for cassettes is widespread and not restricted just to students. Also roughly a quarter of requests (24%) were for copies of programmes not included in the Loan Service, showing that demand is not limited to a particular set of courses either.[7]

Operationally the Loan Service worked extremely well, most students comments on the service have been highly complementary and enthusiastic.

The impact of the Service canbe seen in the enhanced viewing figures achieved for programmes included in the scheme. On average there was an increase in viewing rates of 11 percentage points over and above those achieved by a single transmission. This compares with an increase of 8 percentage points typically achieved by post-foundation course repeat broadcasts. Thus the Loan Service not only compensated for the loss of repeat transmissions on the courses concerned, it actually produced a significant increase in their viewing figures. In other words making these programmes available on cassette increased their accessibility compared with repeat broadcasts.

In addition to improving student access to programmes, the Loan service had an effect on the other two critical variables: control and integration.

Students descriptions of the way they used cassettes showed that they were able to study programmes more effectively by exploiting the interactive control characteristics of cassettes. Many students reported that being able to borrow programmes on cassettes enabled them to watch the programmes in step with the rest of their studies. Not surprisingly students who borrowed cassettes tended to view them more than once (1.7 times on average) and they frequently interrupted the tapes to review, clarify or take notes on points. A third of students interrupted their cassettes on the first viewing and only a third watched cassettes through continuously on subsequent viewings. A significantly higher proportion of cassette viewers made their own notes on programmes compared with broadcast viewers (56% and 42% respectively) Cassette viewers also reported that they felt that the cassettes had enabled them to achieve a greater understanding of the material presented, unlike many broadcast programmes. Videocassettes of the programmes in the Loan Service were given significantly higher helpfulness ratings than were broadcasts of the same programmes in the previous year.

In other words, substituting video cassettes for repeat broadcasts not only increased the accessibility of programmes overall but improved their control characterisitcis and perceived degree of integration with the rest of the course materials. These changes were reflected in enhanced student learning and appreciation of the value of television as a course component even though the content remained unchanged. Interestingly these findings are in accordance with the results obtained when the University began to convert from broadcast radio to mailed audio cassettes of radio programmes.[8]

Cassettes versus repeat broadcasts

These findings suggest that the Videocassette Loan Service has been a success in that it has significantly increased the effectiveness of what has been shown to be a very high cost learning medium. However, at a time when the University is struggling with the disruptive effects of a £3.5 million shortfall in its annual grant, one has to ask whether it can afford to use television more effectively.

The estimated cost of distributing a returnable video cassette copy of one television programme is £3.00, assuming an eight year course life.[9] This figure includes cassette costs, recording, packing and postage plus an element for capital investment in the recording equipment. Using this figure as a basis, the annual cost of the Video Cassette Loan Service operated at the 1982 level and assuming an eight year amortisation period is approximately £40,500, excluding the cost of the regional replay network. Of this figure only £17,850 represents direct student requests, foundation course regional library tapes cost £4,000 and other requests such as those from faculties and regional offices cost £18,600 approximately.

The Loan Service replaced 401 repeat transmissions. Taking the average cost of transmission of a programme as £268 the equivalent transmission costs would have been £107,468. Thus the Loan Service resulted in a net annual saving of approximately £67,000 on programme distribution costs while at the same time it improved the overall accessibility of programmes, compared with repeat transmissions.

On this basis it is clear that, in the short term at least, the Video Cassette Loan Service should be expanded as rapidly as possible to take advantage of the economies of cassette distribution.

Abolition of broadcasts?

The educational advantages of videocassettes compared with broadcast television are such that it is reasonable to consider whether broadcasts should be replaced entirely by cassettes. There are two issues embedded in this question. Firstly, should broadcasts be replaced by cassettes as the distribution medium for Open University television material? Secondly should the format of O.U. programmes be changed to take advantage of the characteristics of cassettes? Research has shown that the educational effectiveness of videocassettes can be further enhanced by designing them to exploit their control characteristics.[10,11.]

The first issue is predicated on questions of cost and access. If cassettes were mailed automatically to students, rather than on demand, it would be feasible to record up to four programmes per cassette. The unit cost, including return postage and packing would come down to 75 pence per student per programme, assuming an eight year course life. At this level it is more economical to switch from broadcasts to video cassettes on those courses with less than 357 students per year.[9]

The problem here is access. In 1982 only a third of students (31.5%) had access to VHS equipment, excluding the network of players provided by the University. (There are a variety of video formats, all mutually incompatible. VHS was selected as the University standard because it was the most widespread and fastest growing format in the domestic sector.) In the long run this situation will improve as more students obtain their own video players.

A recent survey has shown that if cassette copies of programmes were available free of charge then roughly 45 per cent of our students could be expected to buy, rent or otherwise obtain access to VHS video equipment

for replay purposes.[1] In fact, the proportion may be even higher. Screen Digest[12] have estimated that 50 per cent of British homes will have a video cassette player of some kind by 1986.

While access to video replay equipment remains below 50 per cent there is a clear need for a supplementary network of video players if the University is to take advantage of the economies of cassette distribution. Without such a network there are two clear implications for cassette-only courses. Either video components will become even more of an optional extra than they are at present or, if the cassettes are to have a more important teaching role, then students taking these courses will be seriously disadvantaged if they do not have access to a VHS video player.

Nevertheless, leaving aside for the moment the temporary difficulty of access to replay equipment, there is no doubt that there are significant savings to be gained from switching from broadcasts to cassette only distribution on low population courses.

Regarding the issue of interactive video versus broadcast format, the former has undeniable educational advantages over the latter. 'Developing mathematical thinking' (EM235) is an example of an Open University undergraduate course which has broadcast television programmes designed as interactive video-cassettes. The target population for EM235 is school teachers who, it is argued, have convenient access to video recorders through their place of work. Thus, the primary method of distributing EM235 programmes is by broadcasts, although copies are available on cassette through the Videocassette Loan Service. Students

are expected to record the programmes off-air for use as cassettes. In terms of their production and distribution costs these programmes are indistinguishable from conventional broadcasts. However they are very different in terms of their approach.

The programmes are segmented into sequences ranging from two to six minutes in duration. At the end of each sequence students are directed to stop and take notes on, or discuss, what they have seen and heard. Also the programmes are highly integrated with the rest of the course. The course texts draw explicitly on specific sequences to develop and illustrate their teaching points and there are notes which summarise the contents and focus of each programme, followed by student activities for each sequence.

The feedback on EM235 showed that students took considerable advantage of the access and control characteristics of the cassettes. Overall the programmes were very successful, stimulating a high degree of involvement, interaction and analysis.[10] Exploitation of the same characteristics has resulted in a highly successful growth of the use of audio cassettes instead of broadcast radio in O.U. courses.[8]

The EM235 experiment shows that interactive format video material can be distributed by broadcasts providing students can record it off-air for reviewing on cassette. In 1982 roughly 35 per cent of Open University Undergraduates had access to a videocassette player of some kind for recording programmes off-air.[1] Thus at present, student access is not sufficiently high to allow the distribution of interactive video material by broadcast alone except in the case of specialist groups. Again this situation can be expected to change within the next three or four years.

Future options for television

On the assumption that television will continue as a component of most Open University courses, decisions have to be made about the most effective and cost effective ways of delivering it to students. At present it is clear that the high investment in television production is considerably under exploited. From an educational point of view video cassettes are more effective than broadcast format programmes because of their access and control characteristics and their potential for integration with other course components. In some circumstances cassettes are also a more cost-effective distribution medium than open circuit transmissions.

In the immediate future (i.e. 1984-85) the most likely strategy is a continuation of repeat transmissions for large population courses and single transmissions plus inclusion in the Video Cassette Loan Service for medium and small courses. In 1984 there will be 85 courses in the Loan Service (compared with 81 in 1983 and 37 in 1982) and these courses have been chosen on the basis of single transmissions only and an undergraduate population of 700 or less. The only significant change in 1984 is likely to be the withdrawal of the video reply network. The total cost of supplying the network of 243 machines in 1982 was approximately £82,000[7] and at the time of writing their withdrawal seems inevitable as part of the University's cut-back in expenditure. The network was in fact considerably underused in 1982. Most of the machines were located in study centres and students reported that they found these locations too inconvenient. Another reason for low usage could be that the Loan Service was in its first year of operation and thus not all

students realised the potential of the facilities available. Also in 1982 cassettes were available as a supplement to broadcasts. Thus the replay network provided a back-up to a system which was itself only a back-up to the main distribution system for programmes i.e. broadcasts and its withdrawal should not greatly inhibit the effectiveness of the Loan Service.

In the medium term, when access to video recorders is roughly 50 per cent (i.e. 1986 roughly) the best strategy is likely to incorporate three separate programme distribution methods. Low population courses will employ interactive video cassettes only. Medium size population courses will employ a mix of single transmissions plus video cassette loans on demand. For this category of courses the video components would have to be in conventional broadcast format. Large population courses will continue to employ broadcasts only, with repeat transmissions.

There are two questions to be answered in relation to this scenario. How big is a "medium size course" and how will students on low population courses view their cassettes?

It seems likely that medium size courses will be defined as those with populations of between 300 and 1000 students.[9] In 1983 there were 55 medium size courses with television programmes. Taking the average number of programmes per course as 11 and the average population as 500 students, the transmission costs for these courses were about £162,000, assuming single transmissions only. Switching to video cassette loans instead of broadcasts would cost approximately £947,000

annually, including the amortised costs of the foundation course cassettes but excluding other non-student requests. However, this figure assumes that all students would request copies of all their course programmes. In 1982 only 12 per cent of those eligible requested cassette loans and on average they requested only three programmes each. Assuming this level of demand, switching from broadcasts to cassettes would cost only £33,700 approximately, i.e. a net saving of about £128,300 annually. Of course, as more students begin to appreciate the advantages of cassettes over broadcasts the proportion of cassettes requested is likely to increase.

From 1985 onwards cassettes are likely to be the only means of distributing television to courses with populations of less than 300 students.[9] Since more than half the students are unlikely to have access to suitable video equipment by that date there is a need for a supplementary network of players in the medium term. Retention or reinstatement of the replay network should thus be a high priority. It should be possible to fund a network out of the savings in reduced transmissions. The characteristics of appropriate locations have been discussed elsewhere.[13]

In the long term, when access to video equipment is widespread it should be possible to phase out both the Video Cassette Loan Service and the video replay network. Students taking low population courses will be given returnable cassettes while video material will be distributed to medium and large population courses through broadcasts, to take advantage of the cost effectiveness of both distribution methods. The

difference will be that in both cases the programmes will be in interactive video format and students will be expected to record broadcasts off-air for re-use as cassettes. Such a strategy will maximise the returns on investment in programme production which is at present so disproportionately high.

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